DKG-207 AMF AND REMOTE START UNIT INSTALLATION AND OPERATING INSTRUCTIONS

INPUTS AND OUTPUTS

Term	Function	Technical data	Description
1	**GENERATOR CONTACTOR**	Relay output, 16A-AC	This output provides energy to the generator contactor. If the generator phases do not have acceptable voltage or frequency values, the generator contactor will be de-energized. In order to provide extra security, the normally closed contact of the mains contactor should be serially connected to this output.
2	**U**	Generator phase input, 0-300V-AC	Connect the generator phases to these inputs. The generator phase voltages upper and lower limits are programmable.
3	**GENERATOR NEUTRAL**	Input, 0-300V-AC	Neutral terminal for the generator phases.
4	**MAINS NEUTRAL**	Input, 0-300V-AC	Neutral terminal for the mains phases.
5	**T**	Mains phase inputs, 0-300V-AC	Connect the mains phases to these inputs. The mains voltages upper and lower limits are programmable.
6	**S**		
7	**R**		
8	**MAINS CONTACTOR**	Relay output, 16A-AC	This output provides energy to the mains contactor. If the mains phases do not have acceptable voltages, the mains contactor will be de-energized. In order to provide extra security, the normally closed contact of the generator contactor should be serially connected to this output.
9	**OIL PRESSURE SENDER**	Input, 0-5000 ohms	Analogue oil pressure sender connection. Do not connect the sender to other devices. The input has programmable characteristics and connects to any kind of sender.
10	**COOLANT TEMP. SENDER**	Input, 0-5000 ohms	Analogue high temperature sender connection. Do not connect the sender to other devices. The input has programmable characteristics and connects to any kind of sender.
11	**BATTERY POSITIVE**	+12 or 24VDC	The positive terminal of the DC Supply shall be connected to this terminal. The unit operates on both 12V and 24V battery systems.
12	**GROUND**	O VDC	Power supply negative connection.
13	**RELAY-1 (HORN RELAY)**	Output 10A/28VDC	This relay has programmable function, selectable from a list.
14	**START RELAY**	Output 10A/28VDC	This relay controls the engine cranking.
15	**FUEL RELAY**	Output 10A/28VDC	This relay is used for fuel solenoid control. It is internally connected to terminal **16** for supplying the charge alternator's excitation current.
16	**CHARGE**	Input and output	Connect the charge alternator's D+ terminal to this terminal. This terminal will supply the excitation current and measure the voltage of the charge alternator.
17	**RELAY-2 (STOP RELAY)**	Output 10A/28VDC	This relay has programmable function, selectable from a list.
18	**LOW OIL PRESSURE**	Digital inputs	These inputs have programmable characteristics selected via the program menu. Each input may be driven by a '**normally closed**' or '**normally open**' contact, switching either **battery+** or **battery-**. The effect of the switch is also selectable from a list. See **PROGRAMMING** section for more details.
19	**HIGH TEMP**		
20	**RECTIFIER FAIL**		
21	**EMERGENCY STOP**		
22	**SPARE/REMOTE START**		
23	**PROGRAM LOCK**		
24	**CURR_U+**	Current transformer inputs, 5A-AC	Connect the generator current transformer terminals to these inputs. Do not connect the same current transformer to other instruments otherwise a unit fault will occur. Connect each terminal of the transformer to the unit's related terminal. Do not use common terminals. Do not use grounding. Correct polarity of connection is vital. If the measured power is negative, then change the polarity of each 3 current transformers. The secondary winding rating shall be 5 Amperes. (For ex. 200/5 Amps).
25	**CURR_U-**		

PROGRAMMING

To **enter the program mode**, press the **MENU** button for 5 seconds. The program mode is only allowed if the **PROGRAM LOCK** input (terminal_23) is left open. If this input is tied to **GROUND**, the program value modification will be disabled to prevent unauthorized intervention. It is advised to keep the **PROGRAM LOCK** input tied to **GROUND**.

The program mode will not affect the operation of the unit. Thus programs may be modified anytime, even while the genset is running.

In program mode, when the **MENU** key is pressed the display will show the program parameter number, when the **MENU** key is released the display will show the program parameter value. The first program number is "**000**". Each depression of the **MENU** key will cause the display to switch to the next program parameter. If the **MENU** key is hold pressed the program numbers will increase by steps of 10. After the last parameter, the display switches back to the first parameter. The displayed parameter value may be increased or decreased using "▲" and "▼" keys. If these keys are hold pressed, the program value will be increased/decreased by steps of 10.

Program parameters are kept in a non-volatile memory and are not affected from power failures.

To **exit the program mode** press one of the mode selection keys. If no button is pressed during 1 minute the program mode will be cancelled automatically.

Pgm	Definition	Unit	Std
0	Current Transformer Primary	A	500
1	Current Transformer Decimal Point		0
2	Overcurrent Limit	A	500
3	Excess Power Limit	KW	350
4	Mains Voltage Low Limit	V	170
5	Mains Voltage High Limit	V	270
6	Gen. Voltage Low Limit	V	180
7	Gen. Voltage High Limit	V	270
8	Low Freq. Alarm	Hz	30
9	Low Freq. Warning	Hz	40
10	High Freq. Warning	Hz	54
11	High Freq. Alarm	Hz	57
12	Low Battery Voltage Warning	V	9.0
13	High Battery Voltage Warning	V	31.0
14	High Battery Voltage Alarm	V	33.0
15	Low Oil Pressure Warning	Bar	1.5
16	Low Oil Pressure Alarm	Bar	1.0
17	High Temperature Warning	ºC	90
18	High Temperature Alarm	ºC	98
19	Oil pressure sender type	-	1
20	Temperature sender type	-	1
21	Hysteresis Voltage	V	8
22	Engine Heating Temperature	ºC	50
23	Holdoff timer	sec	8
24	Overcurrent / Excess Power Timer	sec	3
25	Wait before Fuel	min	0
26	Preheat timer	sec	1
27	Start Timer	sec	6
28	Wait between Starts	sec	10
29	Engine Heating Timer	sec	3
30	Mains Waiting Timer	min	0.5
31	Cooling Timer	min	1.0
32	Generator Contactor Timer	sec	1
33	Mains Contactor Timer	sec	1
34	Stop Timer	sec	10
35	Start Attempts	-	3
36	Horn Timer	sec	10
37	Engine Heating Type	-	0
38	Charge input alarm	-	0
39	Not used	-	0
40	Not used	-	0
41	Emergency Backup Operation	-	0
42	Remote Start Operation	-	0
43	Modem Connection	-	0
44	Maintenance Period (Engine Hours)	hours	200
45	Maintenance Period (Months)	month	6
46	Not used	-	0
47	Max Engine Run Period	hours	0
48	Not used		
49	Not used		
50	Not used		

The parameters P_051 / P_052 define the functions of relay outputs. The unit has 6 relay outputs and 2 of them have programmable functions. The fixed function relays are Fuel, Start, Mains Contactor and Generator Contactor. Relays with programmable functions are RELAY-1 and RELAY-2.
The function of a programmable relay output may be selected from the below list.

Pgm	Definition	Std
51	RELAY-1 function	01
52	RELAY-2 function	03

00	Fuel
01	Horn
02	Start
03	Stop
04	Gen. Contactor
05	mains Contactor
06	Choke
07	Preheat
08	Alarm
09	Warning
10	Alarm+Warning
11	Automatic ready
12	-
13	-
14	-
15	-
16	Oil switch alarm
17	Temp switch alarm
18	-
19	Rectifier alarm
20	Emerg.Stop alarm
21	-
22	Spare Alarm
23	-
24	Oil sender alarm
25	Temp sender alarm
26	Speed alarm
27	Start fail alarm
28	Charge alarm
29	Overload alarm
30	Voltage alarm
31	Battery High alarm
32	Oil switch warning
33	Temp switch warn.
34	Level switch warn.
35	Rectifier warning
36	Emerg Stop warn.
37	
38	Spare warning
39	-
40	Oil sender warning
41	Temp sender warn.
42	Speed warning
43	-
44	Charge warning
45	Battery low warning
46	-
47	Battery high warn.

TROUBLESHOOTING

The genset operates while AC mains are OK or continues to operate after AC mains are OK:

-Check engine body grounding.
-AC mains voltages may be outside programmed limits, measure the phase voltages.
-Check the AC voltage readings by pressing the MENU button.
-Upper and lower limits of the mains voltages may be too tight. Check the parameters P_004 and P_005. Standard values are 170/270 volts.
-The hysteresis voltage may be given to excessive. Check the parameter P_021, the standard value is 8 volts.

AC voltages or frequency displayed on the unit are not correct:

-Check engine body grounding, it is necessary.
-The error margin of the unit is +/- 3 volts.
-If there are faulty measurements only when the engine is running, there may be a faulty charging alternator or voltage regulator on the engine. Disconnect the charging alternator connection of the engine and check if the error is removed.
-If there are faulty measurements only when mains are present, then the battery charger may be failed. Turn off the rectifier fuse and check.

KW and cosΦ readings are negative although the Amp readings are correct:

-The current transformer is connected with reverse polarity. Change the CT polarity.

Short circuit the outputs of unused Current Transformers.

When the AC mains fails the unit energizes the fuel solenoid, but does not start and OIL PRESSURE led flashes:

The unit is not supplied with battery (-) voltage at the oil pressure input.
-Oil pressure switch not connected.
-Oil pressure switch connection wire cut.
-Oil pressure switch faulty.
-Oil pressure switch closes too lately. If oil pressure switch closes, the unit will start. Optionally oil pressure switch may be replaced.

The engine does not run after the first start attempt, then the unit does not start again and OIL PRESSURE led flashes:

-The oil pressure switch closes very lately. As the unit senses an oil pressure, it does not start. When oil pressure switch closes the unit will start. Optionally the oil pressure switch may be replaced.

When the AC mains fails, the engine starts to run but the unit gives START FAIL alarm and then the engine stops:

-The generator phase voltage is not connected to the unit. Measure the AC voltage between terminals **U** and **Generator Neutral** at the rear of the unit while the engine is running. A fuse protecting the generator phases may be failed. A misconnection may be occurred. If everything is OK, turn all the fuses off, and then turn all the fuses on, starting from the DC supply fuse. Then test the unit again.

The unit is late to remove engine cranking:

-The generator voltage rises lately. Also the generator remnant voltage is below 20 volts. The unit removes starting with the generator frequency, and needs at least 20 volts to measure the frequency. If this situation is to be avoided, the only solution is to add an auxiliary relay. The coil of the relay will be between BATTERY (-) and charging alternator D+ terminal. The normally closed contact of the relay will be connected serially to the unit's START output. So the starting will also be removed when the D+ pulls to battery positive.

The unit is inoperative:

Measure the DC-supply voltage between terminals 11 and 12 at the rear of the unit. If OK, turn all the fuses off, then turn all the fuses on, starting from the DC supply fuse. Then test the unit again.

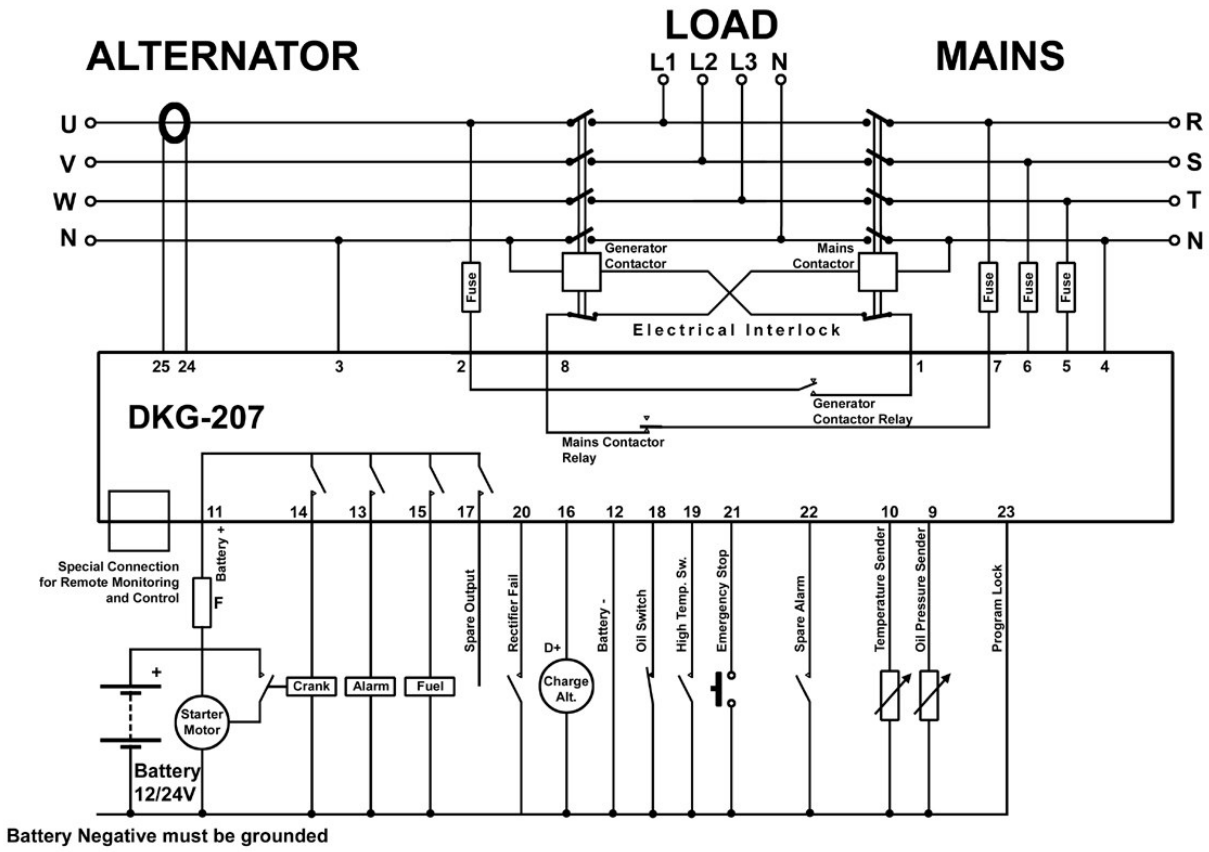
Programming mode can not be entered:

The program lock input disables programming mode entry. Disconnect the program lock input from battery negative before modification. Do not forget to make this connection again to prevent unauthorized program modifications.

TECHNICAL SPECIFICATIONS

Alternator voltage: 0 to300 V-AC (Ph-N)
Alternator frequency: 0-100 Hz.
Mains voltage: 0 to 300 V-AC (Ph-N)
Current input: from current transformer, .../5A. Max load 0.7VA per phase.
Digital inputs: input voltage 0 - 30 V-DC. Internally connected to battery positive via 4700 ohm resistor.
Analog inputs: Resistor input 0 to 5000 ohms connected to the battery negative. Sources 10 mA when closed to battery negative.
Measurement category: CAT II
Air category: Pollution degree II
DC Supply range: 9.0 V-DC to 30.0 V-DC
Cranking dropouts: survives 0 V for 100ms
Typical current consumption: 100 ma-DC.
Maximum current consumption: 350 mA-DC (Relay outputs open)
Generator/mains contactor outputs: 16 A / 250 V.
DC relay outputs: 10A / 28 V.
Max. current for each terminal: 10A-RMS.
Charge alternator excitation current: 54 mA-DC @ 12 V-DC.
Communication port: Logic levels. 2400 bauds, no parity, 1 stop bit.
Operating temperature range: -20°C to +70°C (-4 ºF to +158 ºF)
Storage temperature range: -40°C to +80°C (-40 ºF to +176 ºF)
Maximum humidity: 95%, non-condensing
IP protection: IP65 from front panel, IP30 from the rear
Dimensions: 120 x 90 x 39mm (WxHxD)
Mounting opening dimensions: 116 x 86mm minimum.
Mounting: Front panel mounted, retaining steel spring at the rear
Weight: 250 g (approx.)
Case material: High temperature, self extinguishing ABS (UL94-V0, 110 °C)

CONNECTION DIAGRAM



DATAKOM Elektronics Ltd. http: www.datakom.com.tr
Tel : +90-216-466 84 60 Faks : +90-216-364 65 65 e-mail : datakom@datakom.com.tr